

ABSTRACT OF THE DISCLOSURE

An optical reading device comprising a housing for receiving a test plate on which, according to a fixed pattern, test substances can be provided, which reading device further comprises optical conversion elements for converting light coming from a test substance into a measuring signal which corresponds to a predetermined parameter of the test substance. The optical conversion elements comprise light-receiving areas configured in a pattern which corresponds to the pattern of the test plate. Due to the invention, it becomes possible to measure, in a non-invasive manner, an oxygen concentration in a test substance, such as a cell culture, without the oxygen content being disturbed by mechanical vibrations. As a result, in a reliable manner, measurements on substances can be performed for determining the toxicity and/or uptake or degradation rate in living cells.